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LIMITATIONS ON TACTICAL MISSILE DEFENSES: NEGOTIATED AND OTHERWISE

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GLOSSARY

ADM Atomic Demolition Munition (i.e., a nuclear "mine")
ALCM Air-Launched Cruise Missile
ASMP A French air-launched strategic attack missile
ATBM Anti-Tactical Ballistic Missile
ATGM Anti-Tank Guided Missile
BAI Battlefield Air Interdiction (a mission involving
 attacks on targets at ranges between those attacked
 in deep interdiction and during close air support)
BDA Battle Damage Assessment (post-strike reconnaissance)
BMD Ballistic Missile Defense
CAS Close Air Support
CEP Circular Error Probable (the accuracy of a missile)
CSBM Confidence and Security Building Measures
DECM Defensive ECM
ECM Electronic Counter Measures
ESM Electronic Support Measures
INF Intermediate Range Nuclear Forces
JSTARS Joint Surveillance, Targeting, and Attack Radar (a
 ground attack analogue of AWACS)
MBFR Mutual and Balanced Force Reductions
OTH Over-the-Horizon (refers to radar detection range)
SCC Standing Consultative Committee (set up under SALT)
SDI Strategic Defense Initiative
SRAM Short-Range Attack Missile
SSM Surface-to-surface missile
TBM Tactical (or theater) ballistic missile
TNF Tactical (or theater) nuclear force(s)
VSTOL Vertical (or) short take-off and landing (said of
 an aircraft requiring little or no runway)

**LIMITATIONS ON TACTICAL MISSILE DEFENSES:
NEGOTIATED AND OTHERWISE**

Kevin N. Lewis

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HOW SDI MOTIVATES THE ATBM AND ABM TREATY ISSUES

What many would probably consider a great success of the superpower arms control process to date--the U.S.-Soviet ABM Treaty of 1972¹--was placed rather abruptly in question on March 23, 1983, when President Reagan called for the mobilization of a unified U.S. Strategic Defense Initiative. The motivation to launch the SDI can be attributed largely to two factors: (1) frustration with a basic nuclear strategy ultimately based on general vulnerability, and (2) the apparent uncovering of new technology options that could help solve the extraordinarily vexing hardware and operational problems inherent in active defense against long-range ballistic missiles.

The current turmoil surrounding active anti-missile defense thus hails to the core of strategy. Even if it were to vanish tomorrow, the SDI and its sequelae would at the very least have promoted a great demonstration of imagination and creativity from a national security community more often reviled for its rigidity and lack of vision.²

*A version of this paper was presented to a 1986 AAAS meeting on Anti-Tactical Ballistic Missile (ATBM) capabilities; the present document follows the lines of that presentation. Some of the context for this particular paper has evolved somewhat since then, but the basic issues discussed herein remain current. A list of acronyms used in this paper follows the body of the text. Elizabeth H. Ondaatje made many helpful editorial suggestions.

¹Along with modifications, namely the protocol of 1974, the existing record of discussions, expressed understandings, etc., and the administrative and consultative apparatus that has grown up around the Treaty.

²There are many ironies in this story. It is interesting, for instance, that long-range ballistic missiles and defenses against them should become such a major issue: after all, curbing the advance of offensive technology has traditionally been the top arms control

Similarly, traditional burrs under the saddles of ballistic missile arms controllers (including the disposition of third-party missile forces and alleged Treaty infractions) pale by comparison with certain questions raised by the SDI *per se*.

It was inevitable that something so controversial should mutate quickly, expanding or at least stimulating the thinking of planners in other areas. One relatively new area of interest and concern has been that of Anti-Tactical Ballistic Missile capabilities (ATBM). Yet the topic of ATBM and arms control remains a highly uncertain one. Despite some precedent, arms control aspects of ATBM are poorly understood. Forecasting the flow of developments is even harder. Finally, potential policies on ATBM--whichever aspect of it we are concerned with--turn out to be tied up with a dizzying array of other major issues that defy simple characterization, never mind swift solution. Therefore, this paper necessarily follows rather general lines.

There is another reason for generality: given the currency and intensity of antimissile defense even as a concept, it is not impossible that the ATBM and arms control debate will decompose into constituent parts. Conversely, it is analytically desirable to separate out the ATBM question from the SDI phenomenon. Grave pitfalls may be encountered if ATBM-related enterprises of several sorts are conscripted into an SDI effort. In a politically motivated rush to demonstrate some capability with relevance to SDI, for instance, existing ATBM-related options may be severely distorted. A consequence of such a development may well be damage to the arms control process, the larger SDI, and to hopes for coherent ATBM policy. The last result could occur if modifications to suit SDI architecture were to cause ATBM options to take on undesirable forms.

It is useful to ask why the ATBM debate has followed the lines it has. From the point of view of this paper, four sources for heightening interest in ATBM matters can be identified, two major, two relatively minor. The two minor ones will not be considered; they are: recent

priority, yet by comparison almost no attention is paid to the air-breathing question--where, it seems, the latest big offensive force technology strides have occurred.

discussion on alternative ways of disrupting the Pact's rear area in a major Central European contingency (and of the corresponding Pact TBM threat); and the NATO INF two-track scheme and the recent successful INF Treaty.

Both the relatively major sources of interest in TBM and ATBM involve the traditional arms limitation agenda more directly. The first set of issues follows from SDI. It is hard logically to separate SDI from many other activities in which the major military establishments are engaged. Even if there are no immediate military repercussions in the tactical balance potentially on account of SDI, for example, a changed deterrence context, new resource allocation patterns, and technology spin-offs would have to be reckoned with. ATBM are particularly involved here for several reasons: one cannot plan to leave allies "undefended" (i.e., outside of the reach of SDI); some kind of combined ATBM/"terminal" element of the overall SDI architecture may be feasible; parallel coalition efforts may be charted to defend against missile threats; and so on. In short, a number of short-term questions present themselves about the extent which the issues and answers involved in SDI can be simply transposed onto the theater environment.

The second of the major issues also concerns possible ATBM arms limitation issues: this is the simmering dispute of recent years over the nature of arms control in the largest sense. Under the Reagan administration, relatively more attention has been paid to the claims of those who have contended that the Soviets' willingness to participate in meaningful arms control has always been questionable. Consequently, some say, future limitation arrangements should focus on the prevention of Soviet misbehavior. For a host of historical reasons, much worry along such lines has been over strategic defense.

In short, we see an array of developments that have begun to push the ATBM issue to the fore. These have been fueled by, and have themselves influenced, a number of historical processes and trends with which many planners are familiar. The basic issues at stake in these processes have, of course, never really been dormant or absent. ATBM was as much an ambition of planners and technologists in the earliest days of the missile era as was ABM. The follow-on U.S. surface-to-

air missile to replace both Nike and Hawk, SAM-D (begun in 1964), originally was supposed to function in both tactical and strategic air defense roles, as well as in an anti-missile capacity. Indeed, the failure of the ABM Treaty to address the ATBM question more fully was attributed to a contemporary desire to retain an option ("loophole") for the deployment of such a multi-purpose system.

Compared with the Soviet Strategic Rocket Forces, the Soviet TBM establishment has clunked along for some time; rumors of modern replacements for the Frog/Scud series circulated in about 1976-78, but the theater nuclear limelight was then occupied, first, by INF issues (such as the Double Track plan, alleged U.S. giveaways on cruise missiles at SALT II, etc.), and then by a series of snafus and side-shows (such as the neutron bomb and freeze and "no first use" movements). Yet all the while, the course of change moved ahead inexorably. Capabilities were demonstrated in the TBM field--mainly with advanced SAMs with a potential ATBM capability. An SA-12 has been reported to have intercepted an SS-12 TBM, for example. Similar demonstrations of both deployed systems (e.g., Patriot), and of technologies (e.g., the FLAG and ERIS experiments) have taken place on the U.S. side. Finally, a number of NATO TBM options were considered under the rubrics of such concepts as "Counterair-90."

Thus, the ATBM concept is not new. Nor are TBM, which have not for long commanded much attention. But the stage on which these issues appear is now set. Reconciling historical trends and issues with contemporary concerns are imperative if any sensible ATBM/TBM arms control policy is to be conceived.

The discussion that follows requires a few caveats. It seems unproductive to consider ATBM options, including limitation options, independently of a policy on TBM. An ATBM "cure" designed in isolation from the TBM "disease" probably faces rough sledding--unless our defensive physicians attribute to their proposed capabilities an ultimate unimpeachable ability to hedge for any and all possible "disease mechanisms" (as some of the more ambitious SDI thinkers do). Second, this paper generally considers the TBM/ATBM problem in a Central European setting. In my view, most of these remarks apply in other

situations though.³ Third, I overlook what some people think is a vital part of the TBM/ATBM conundrum: the specter of chemical payloads for TBM.

THE DESIRABILITY OF ATBM RESTRICTIONS

The first topic to be addressed has to do with our thinking about our relative politico-military well-being if ATBM are or are not allowed in various forms. A corollary question not to be ignored concerns the value placed on TBM by the different players in a particular military setting. Thus, we begin with military utility: the role of TBM is generally to deliver various payloads against preplanned targets located at a significant depth in the enemy's rear (i.e., Corps and Communications Zone) areas. Missiles aimed more remotely than, say, the theater communications zone would depart from the scope of the problem before us, and inhibiting the battlefield (CAS/BAI) type application of TBM (or, more likely, unguided rockets) functioning in an artillery mode is not a fruitful avenue for active defense.

Unlike other means of accomplishing this task, the TBM is a "muzzle loader," relies on a peculiar deployment concept (with an array of advantages and disadvantages), is currently relatively inflexible in target acquisition and retargeting, and performs none or few collateral roles (e.g., BDA, reconnaissance). The technological nature of TBM consequently imposes upon all concerned with countering or employing these weapons constraints that result from the character of the targets and the circumstances under which they are to be attacked--and hence, upon the type of destructive payload that is selected for delivery.

From an ATBM planner's point of view, the crucial distinction among different kinds of TBM is payload: nuclear or conventional. Now, the Pact has fielded a variety of short-ranged theater nuclear threats of this nature over the years, whether their role has been to substitute for, backstop, or even exist apart from, other nuclear strike capabilities. This threat has remained insulated from technological change. What is new, however, is the technology that may permit the

³There is an exception to this extrapolability assumption--maritime use of ATBM-like systems--that I discuss briefly later.

Soviets a cost-effective conventionally equipped TBM. Some accounts report very substantial Soviet TBM CEP improvements, which, together with the latest (guided or area, dispensed or unitary) munitions, now herald a new era in the Soviet TBM threat.

Regardless of payload, at the present time and for the foreseeable future, the baseline target set for TBM in Europe (as far as either side is concerned) is reasonably well characterized. The cost per TBM round, the brief flight-time of TBM, the value of attacking from presurveyed positions in a massive and coordinated blow (for the Soviets, perhaps as part of a so-called "air operation"), the relatively small payload per TBM, various intangible considerations (e.g., the ability of a TBM to harass and thereby degrade ground operations on NATO air bases), certain aspects of the probable combat scenario (for instance, the fact that many lucrative day-to-day targets like kasernes may not be very valuable after mobilization has taken place), and, above all, the nature of the larger strategic setting--notably the reliance by NATO on remote reinforcements, tactical air power, and certain other facility-intensive capabilities--all can be blended together to produce a core target set numbering between, say, 125-500 installations.⁴

If nuclear front-ends are selected, there is really not much doubt that the Pact could place this entire target set at grave risk.⁵ Even

⁴One can only guess about actual Soviet plans, but likely targeted facilities will include many facilities devoted to the West's aviation operation (especially tactical combat bases), key reinforcement reception and processing facilities (prepo, civilian runways capable of turning large strategic airlifters, those ports with the right equipment for servicing highly productive sealift), selected air defense-related installations, appropriate nuclear weapons-related targets, some communications and command facilities and headquarters, and the other usual targets. Some of these targets will, depending on the situation, be attacked in conjunction with other means (tactical aircraft, commandos, saboteurs). Bearing the brunt of a Pact TBM strike will, in my view, probably be selected air defense nodes, key fighter bases, and selected reinforcement-related targets. The core of a Pact missile attack, then, could plausibly fall into the range of some 45-120 high-priority installations, with additional targets to be added depending on other things.

⁵The "high end" target set, moreover, could be chosen, because nuclear payloads could assure the destruction of some targets (like bridges or pipelines) that could not be very plausibly attacked by current conventionally armed Soviet TBM or perhaps even manned aircraft.

were NATO to disperse and harden, virtually all of the targeted installations would be placed out of business for the short run and many would be permanently closed down. Knowing what we do about Soviet doctrine for such an attack, unless it unleashed literally a Sokolevskii-type, 1960s-vintage, all-out "decisive blow" against all of NATO (including political, economic, and other premium targets), the Soviet Union would probably not pull very many punches in executing a selective theater nuclear option.⁶ The Soviets do not apparently subscribe to the notion of extremely refined "signaling" strategies in nuclear employment, nor should they be very interested in these anyway inasmuch as they would already presumably be signaling plenty by launching such a nuclear option in conjunction with a full-scale invasion.

The point of all this is that if the Soviets use TBM in a nuclear mode, they will invariably do NATO great, and possibly mortal, harm (at least when it comes to the two all-important questions of, first, whether NATO can continue to resist in an organized, military way, and, second, whether so much damage might have been done at this point that the notions of "restraint" and "limitation" go up in smoke). It is the West, not the Pact, that relies more heavily on reinforcements, tacair, and the staying power of those units deployed in the theater to offset the Pact's superiority in expendable ground combat formations, manpower, and close-combat weapons. Thus, if the Pact were able to bring about, by nuclear (or perhaps chemical) use, a "trade" of East and West air forces and logistics, they will certainly have accomplished something of

What forms Soviet restraint would take one can only guess at. For instance, Rhein-Main AFB is essential to strategic airlift operations into Central Europe, but this base would be hard to target by nuclear means without generating prodigious numbers of civilian mortalities.

Why, they might wonder, should one sacrifice the advantage of the initiative by down-scaling a nuclear attack given the facts that (1) a substantial political shock administered at the onset of hostilities can do no harm and possibly much good, (2) they are risking dire NATO reaction and hence might as well make the first shot a good one, (3) their aim is to bring about the swiftest possible military victory should the West not collapse politically? For an expansion, see my *U.S. Strategic Force Modernization and SDI: Four Key Issues*, The RAND Corporation, March 1986.

enormous strategic value. (Indeed, the Pact would probably tolerate the loss of its top 90 airfields if it could do away with NATO's top 30.) If NATO is serious about staying in the fight by means *other than* reliance upon risky and politically divisive escalation threats, then it had better consider every conceivable option to prevent the destruction by nuclear means of the key targets mentioned above.⁸

It is equally clear that NATO suffers terribly from such Soviet nuclear use *regardless of how and, within limits, when, a Soviet nuclear option arrives*, whether it is by *Spotznaz*-infiltrated nuclear charges or by variable-range ICBM-delivered MIRVed warheads. Beyond the seminar room, the practical differences between the fine points of delivery vehicle options pale, for great damage, military and otherwise, is done (barring great differences in accuracy and collateral damage, anyway, in some finely-tuned scenarios.)

These facts give rise to three basic determinants that would probably drive all other choices with regards to a potential ATBM deployment against a Soviet nuclear TBM threat. First, it does not make too much sense to concentrate on the terminal defense of a relatively few installations against nuclear missile attack. If for no other reason than sensitivity to the will of democratic publics, one cannot argue for an expensive and "provocative" program to fend off blows against a few military installations (and often non-nuclear-deterrent related⁹ and foreign-occupied ones at that), while leaving other targets, whether civilian or military ones of second rank, undefended.¹⁰

⁸Predictably, since it is rather inconceivable to protect such installations as air bases, ports, and the like by passive means (hardening, mobility, redundancy) it is in this connection that the value of NATO ATBM has been cited.

⁹C.f., the rationale for scaled-back Safeguard.

¹⁰One cannot justify the defense of Rotterdam or Bremen as a byproduct of a military-only defense, leaving other cities and towns at the Soviets' mercy. One cannot, in many peoples' eyes, "lower the nuclear threshold" by fielding some active defenses here and there without being prepared to pay the piper when it comes to increasing the risk of holocaust to other people and places. If a nuclear-oriented defense in Europe is to be built, it will probably have to envision very much larger defensive ambitions.

Second, it does not make much military and strategic sense to defend against nuclear TBM if one does not also defend against other more or less plausible nuclear threats. As noted, this could include nuclear artillery and ADM, ICBM originating in Central Asia (whose faster moving RVs might be able to penetrate ATBM defenses), SLBM threats arriving from odd azimuths, etc. It is for just this reason that NATO never did much (compared with the Pact, anyway) in the nuclear SSM area since the days of Honest John: rather, emphasis has been on offshore capabilities and dual-role aircraft. Such an ATBM defense would represent, then, an inverse Achilles' Heel: only the heel is protected.

Third, as far as their independent deterrent forces go, widespread ATBM cannot be much more welcome in NATO than would be expanded ABM. Existing ABM Treaty legislation essentially recognizes the fact that a determined superpower can deal with "existing" kinds of ABM system. Third powers, however, do risk being neutralized by ABM, and -if the technical parameters of the TBM being defended against happen to overlap with those of the independent deterrent forces--by ATBM, too.¹¹ One can guess that even if costly movement to, e.g., longer-range D-5 systems and the use of penaids like *Chevaline* could provide a hedge against a first-generation Moscow ABM, then, at the least, the confidence of independent deterrent planners might not be much buoyed by the more sophisticated defenses. Nor would ATBM make expensive and controversial programs like the U.K.'s Trident any easier to sell to fractious domestic audiences.

In short, when we take the nuclear side of the TBM problem from the largest Western military perspective, neither ATBM restrictions nor deployments seem right away to be particularly good or bad, except insofar as ATBM may disrupt sophisticated limited nuclear operations, or throw sand into the gearboxes of the independent deterrent forces (and that of the coalition to which these forces belong), or consume scarce budgetary resources. SDI may eventually change this basic calculus, but

¹¹See my "BMD and U.S. Limited Employment Doctrine," *Journal of Strategic Studies*, June 1985.

at the present time, planners identify a broadly-based retaliatory threat as the best deterrent to all Soviet nuclear actions.

Defense against conventional ATBM is another story altogether. Although the picture is analytically murky, we can say with some assurance that, to accomplish anything useful and cost-effective with their TBM arsenal, the Soviets need substantial numbers of weapons. Unless infallible zero CEP guidance options present themselves, the numbers of weapons required to very reliably accomplish key tasks (e.g., close airstrips) will exceed by large margins the Pact numbers (albeit of "launchers") that have appeared in some sources. It will take repeat firing to keep many targets "down" following initial salvoes--though whether this role would be tasked to SSM or other weapons is unclear. On the other hand, with some (often avoidable) exceptions, the consequences of defensive failure probably is not catastrophe. ATBM of a certain type could, moreover, participate in air defense, providing extra flexibility, and a less costly overall SAM "tail." The command, control, and early warning problem for an archipelago of conventionally defended ATBM islands is modest compared to that for area anti-nuclear defense. And nuclear SAMs needn't be considered.

If NATO countermeasures both to the missiles (excepting ATBM, but including rapid runway repair), and to the missile force as it operates over the long haul (e.g., advanced sensors like JSTARS to detect and target Pact TBM launchers on the move) are considered, the Soviets must compensate for NATO ATBM with more and "better" missiles. Unlike defenses against nuclear attack, then, defense against conventional attack can succeed not by near perfection, but by some combination of "adequate" defense, disruption of Soviet plans, denial of intelligence, etc. From a narrow, purely military-technical perspective, it could very well suffice to do an admittedly complex cost-benefit analysis of the role NATO ATBM could play in overturning some part of the TBM menace. For larger theater-forces resource allocation decisions, the contribution of ATBM to "winning" (measured by, e.g., retarding adverse front movement) could be compared with alternatives like buying more ammunition or spare parts. Military advice would then inject judgments to handle qualitative and subjective questions such as measuring the

value of initiatives to "introduce complexity into Soviet planning." Once all this had been done, one could move to the next echelon of the strategic calculation, namely, a balancing of the dual-capability problem, and the introduction of political and other "nontechnical" considerations.

Adjustment of NATO's cost-benefit analysis of ATBM should also take into account NATO's possible use of TBM. Something like the same target set found in NATO exists throughout the Pact zone, albeit with its own unique features. In contemplating whether or not we would like to attack it with TBM, we need to address four kinds of question: (1) are TBM a good, or even the best, way to strike these installations?; (2) given other pressing requirements, is any program falling out of these calculations economically competitive?; (3) if the Soviets deploy ATBM, can we be confident of evading their ATBM potential over the extended run on acceptable terms?; and (4) do the politics of NATO TBM work out?

Right now, the gross approximative consensus answers to these questions would be probably no, no, unknown, and no. We tend, it seems, to trust to our considerably superior tactical aviation resources to carry the ball when it comes to rear-area attack. Where severe environments jeopardize our ability to operate at will with low attrition (especially early on in a war) we have opted to explore possibilities at the cutting edge of the strike concept--stealth, stand-off munitions, defense suppression, etc. Indeed, since a lightning, exquisitely-timed blow is not quite as important an option for NATO as it is for an aggressor, slower (than TBM) aircraft and cruise missiles might be effective counters. Regarding costs, deficiencies in NATO's current conventional posture require rigorous validation of any proposed new capability that does not deal with and may detract from the remedy solution of more mundane imbalances in the overall balance. When it comes to offense-defense interactions, the issue, then, is probably more financial than anything else. And, as far as politics go, even a spectacular capability in the form of TBM might be prohibited for political reasons.

We conclude this section by touching on the dual-capability question. Specifically, what probability should we ascribe to the Soviets' choice to opt for nuclear as opposed to conventional payloads? We develop estimates by exploring Soviet doctrinal meanderings, high-level politics, and other sources. Yet the most telling evidence is to be found in Soviet posture. Given estimated and probable near-term CEPs, available warloads and overall reliability, it is reasonable to suppose that the Pact can be confident in knocking out a not trivial fraction of the "key NATO target base" described above.

On the other hand, if only nuclear use is anticipated, nowhere near the size TBM posture currently deployed by the Pact is needed. Only in a bizarre Soviet version of some 1950s "battlefield nuclear war" concept would so many nuclear rounds find meaningful application. And there is little to the rest of Soviet policy or the Pact's posture to suggest that an extremist "integrated battlefield" philosophy is current doctrine. Therefore, one can presume that current Soviet posture reflects a straddling of the question. More data on reloads and command and control arrangements would greatly facilitate efforts to answer key questions. But in the absence of all such information, it is clear that our ATBM policy must accommodate many uncertainties.

A few things pertinent to a framework for evaluating ATBM and its arms control issues are thus clear. The most important probably concerns the very different different problems demanded by the two tasks: defense against a nuclear, and against a large conventional threat. Depending on a range of matters, the former involves area defense. It is therefore virtually bound to be expensive, politically problematic, doomed to live on the razor's edge when it came to maintaining the system's capability against threats to command and control, and so on. On the other hand, the latter can probably achieve reasonable military goals, everything else being equal.

EXISTING LIMITATIONS, AND THE INTENT OF THOSE CONSTRAINTS

Let us now consider the context within which ABM Treaty negotiations took place in order to comprehend the interactions of three considerations: the specific objectives of the Treaty's framers regarding the objectives of the Treaty; perceptions concerning the overlap of ABM and certain analogous capabilities (including ATBM); and the expectations, as embodied within the Treaty (along with other relevant statements), of the possible ways in which what is invariably called a "gray area" between the Treaty (and the ABM concepts it regulated), and those analogous concepts, might evolve. Everyone believes there is a problem with ambiguity: a 1985 administration report recognized the existence of "gray areas ... not fully defined in the ABM Treaty."¹² But ambiguity with respect to what?

Negotiated in tandem with the SALT accord, the Treaty sought to take into account: (1) uncertainties (e.g., few guessed correctly exactly how MIRV in conjunction with accuracy would affect the balance); (2) one-sided peculiarities (e.g., third-party threats, which were of greatest direct interest to the Soviets); and (3) asymmetries in the implementation of strategic doctrine by both sides (a chief consideration of which was the relatively greater Soviet reliance on large ICBMs). The Treaty also recognized the contemporary status of both sides' active defense programs, the technological situation, and both sides' ability to handle other aspects of the overall strategic threat. Despite these asymmetries, the strategic objectives of both the U.S. and Soviet signatories pivoted on an apparently congruent sense of what stability meant. The Treaty has probably not been unsuccessful in supporting this aim of stability to date.¹³

¹²U.S. Department of Defense, *Annual Report to the Congress on the Strategic Defense Initiative*, 1985, p. B-2.

¹³True, critics of ABM generally, as well as those who contend that ABM has unfairly restrained the U.S. would do well to recall the strategic context through the 1970s. In my opinion, there is no evidence to suggest that what the Soviets did put on-line in their Moscow system bought them very much. Limitations have certainly bought us something. If for no other reason, during the duration of the so-called post-Vietnam "hangover," U.S. defense budgets plunged. In conjunction with a very pressing need to compensate for deferred

Framers of the ABM Treaty were also aware not only that advances in technology might undermine the intent of the Treaty,¹⁴ but also that incremental or other improvements in systems intended to perform in roles analogous to that of the antiballistic missile mission might lead to systems that could either gradually evolve into an ABM capability or to some kind of "skeleton" that might be exploited to achieve a "break-out" from an ABM Treaty. In both cases, air defense is of interest. Many of the complex functions involving the detection, assessment, interception, and destruction of aerial targets are, obviously, not unlike those involved in ABM operations, whether the target being defended is under attack by an aircraft, attack missile, powered bomb, unmanned vehicle, rocket, or other weapon.

With many air defense activities involving the handling of demanding threat traffic, both the United States and Soviet Union were interested in the late-1960s (as they are today) in high-performance SAMs as one component of their active air defense plans.¹⁴ Each, however, was approaching the high-performance SAM problem differently: the United States sought to design sophisticated systems (Patriot and Standard) relying on advanced sensing and electronics; the Soviets'

spending, block obsolescence, and a number of other woes, we can count ourselves fortunate in having been able to evade an obligation to spend on ABM funds desperately needed elsewhere. Advocates of expensive SDI line items in the mid-1980s should remember that just a decade ago the Mickelson BMD site was shut down almost immediately after it went on-line explicitly for financial reasons. Putting aside any "political" or "strategic" arguments in favor of this Treaty, at the very least, in short, we freed up a *minimum* of \$20 billion from strategic defense between 1972 and 1983. Considering the paucity of investment in U.S. offensive forces through the 1970s, the implications of this "savings" are not minor.

Hence, the incorporation of stipulations concerning exotic systems and ABM concepts that were, at the time of Treaty's signing, either beyond the technical means of the participants, decisively vulnerable to countermeasures, or available only at intolerable cost.

¹⁴Traditionally, the Soviet Union has placed more emphasis on the use of SAMs within an integrated air defense structure, whether the defensive task envisioned has been strategic homeland defense, theater area defense, forward battle zone defense, or maritime defense. The U.S. has, in general, tended to rely relatively more on manned systems as both combatants and sensing and control platforms.

approach at one point generally favored a more "brute force" form emphasizing large size, high power, etc.

Although the ability of each approach either to go beyond relatively shorter-ranged weapons and/or do everything in one airframe was highly limited, it was not inconceivable to Treaty planners that true multi-purpose systems could ultimately be developed. Whether deliberately or opportunistically employed, such weapons could provide a basis for either a creeping-out or break-out of the ABM Treaty, as the case might be. To ensure against this threat to stability, the ABM Treaty's Article VI(a) prohibited either side from acquiring "missiles, launch ramps, or radar instruments," which, though they may not have been designed exclusively to defend against ballistic missiles, had nonetheless a capability to engage strategic missiles. Likewise, the modification of any existing system to achieve such a capability was banned, as was the demonstration of a "capability" to engage strategic missiles. In other words, the ability of a missile or related system to function in an ABM role made it, *de facto*, an ABM system, and subjected it to the Treaty, a logical enough matter. But, for the sake of stability, the Treaty goes beyond the mere fact of dealing with a military capability "once it winds up in the ABM category"; if one views the Treaty as a statement of what is desirable and necessary as well as what simply must not be done, then one was, in fact, enjoined in the first place from setting out to design any air defense weapon (missile, radar, or whatever) with an ABM capability in mind.

It is one thing to state this intention, and another to legislate precisely so as to enforce it. Again, Article VI(a) of the Treaty bans giving non-ABM "missiles, launchers, or radars [other than those designated and authorized as part of an ABM capability] capabilities to counter strategic ballistic missiles or their elements in flight trajectory, [and testing] them in an ABM mode." As has been pointed out, this leaves unresolved the question of just what is meant by "capability to counter," "strategic ballistic," and "test in an ABM mode." Without explicit definitions, all this has a sort of tail-chasing quality: the crux of the matter revolves around one's exact interpretation of what observable parameters and qualities distinguish:

a "strategic ballistic missile" in flight from a nonstrategic one; a missile in flight that is being operated "strategically" from one--perhaps the same type--that might be flown in a "nonstrategic" fashion; or, finally a strategic missile that is being flown in characteristically "strategic" way, as opposed to a missile (again, perhaps an identical version) that was being observed in some other context. In other words, unless there exists some way of characterizing the defense itself, it is not possible to enforce the intentions of the Treaty.

An ABM system is characterized in terms of the targets it is capable of engaging (or against which it is pitted, even without success, if the style of engagement nonetheless suggests an ABM-seeking motive). The essential issue, then, is whether the technical parameters and qualities that are construed to define an inbound target of strategic type do or do not also describe the sorts of threats that would constitute targets for an ATBM system. One can go by the definitions appearing in Article II of SALT II (i.e., ICBM with range exceeding 5,500 km and SLBM of strategic type), but here one is confronted with well-known problems (e.g., some land-based missiles not considered "strategic" seem more strategic than some definitionally "strategic" SLBMs). One could, therefore, test "legally" a reputed ATBM system against, say, an SS-4; and acquire in so doing an "illegal" capability against a strategic SLBM warhead.

This path leads to the concept "test in an ABM mode." The 1985 SDIO *Annual Report* defines "tested in an ABM mode" for an interceptor as meaning that an attempt has been made to intercept a strategic ballistic missile in flight¹⁵; in 1978, an attempt was made to resolve the definitional quandary. The result, a partial success according to some sources, was an Agreed Statement attached to the Treaty, the technical details of which remain classified. Apparently, the U.S. asserted that the parameters should be set so that the Treaty should apply if a target involved in a test would, at some point in its trajectory, achieve an altitude of more than 40 km and a velocity greater than 2-4 km/sec.¹⁶

¹⁵DoD Annual Report on SDI, p. B-5.

¹⁶Public speculation on the terms of this definition can be found in T.K. Longstreth, et al., *The Impact of U.S. and Soviet Ballistic*

But this account indicates that the Soviets could not be persuaded to accept the whole of this definition. It suggests that what the Soviets vetoed can be guessed from the U.S. unilateral statement, accompanying 1978 SCC discussions, which stipulated the following meaning of "flight tested in an ABM mode":

(to be) tested against a target vehicle which has a flight trajectory with characteristics of a strategic ballistic missile flight trajectory ... (or) tested to an altitude inconsistent with interception of targets *against which air defenses (would be employed)* [emphasis added]

This statement logically indicates the importance of the altitude of the target being engaged: according to this source, it was this part of the definitional criterion (i.e., that of an altitude above which a target ceased to be considerable as an aerodynamic one) that could not successfully agreed on by U.S. and Soviet negotiators.

If one subscribes to the belief that an air defense system able to perform in an ATBM mode might also function in an ABM role--which is analogous to saying that key engagement parameters of defined "strategic" targets are not, so far as the system is concerned, measurably different from the parameters presented by other targets--then air defense or ATBM (or dual) systems cannot, at least in the absence of an altitude restriction, be identified short of a flagrant testing violation. Where does this leave us, insofar as present SAMs--and possible plans to upgrade them into ATBMs of some capability--are concerned?

Barring the publication of the still-classified technical definitions, recent developments suggest that one or both of the parties to the Treaty have drifted closer over time toward violating it. On the U.S. side, reports acknowledge the upgrading the I-HAWK and Patriot to possess a not trivial counter-missile capability. Apparently, in the case of Patriot, the missile already possesses the right mix of technical credentials so that its conversion for ATBM employment can be

Missile Defense Programs on the ABM Treaty, (3d Edition), National Campaign to Save the ABM Treaty, March 1985, p. 24 and p. 55.

effected only by modification of missile and firing unit software. Thus, if Patriot does--in whatever configuration--tread near the line demarking "strategic" as opposed to other capabilities, then the United States may have already violated the ABM Treaty or come close. For instance, ABM Treaty Article V(1) bans systems that are mobile and land-based, which Patriot is. Patriot also violates a ban on ABM launchers that can launch more than one interceptor at a time. Similarly, Article V(2) bans rapid ABM launcher reload, and the replaceable box launcher on Patriot is one of its attractive features. Most important of all, Article IX bans transfer of ABM systems or components to other states and deployment of components outside national territory: Patriot is forward-based, of course, and it is being provided not just to U.S. forces in forward areas, it is being marketed.

Yet for at least five reasons, it is highly improbable that Patriot does transgress, or, if the missile does violate some of the technical provisions of the Treaty, then there seems to be only one logical explanation for the lack of Soviet outcry. First, it is relatively unlikely that any capability of Patriot pertinent to the definitions of "strategic" has been successfully concealed to the present time. A weapon that is to be transferred (without derating) to a foreign power--notably one very sensitive to superpower interactions--simply cannot be expected to remain that secure for very long. Second, the same case can be made for a developmental system that is scheduled to go into the field as fast as possible, and that will be in an operational status in large numbers, given the priority of defensive counter-air capabilities in NATO. Third, as impressive as it is, Patriot would not seem to represent much of a quantum performance improvement over SAM systems deployed in the active U.S. Navy inventory. Fourth, the U.S. has made no attempt to downplay its ATBM enhancement activities to date. One would have expected a softer touch if even a remote chance of Treaty violation had been perceived. Fifth, the Soviets have missed few opportunities for criticizing other U.S. activities that they see jeopardizing the ABM Treaty; even if Patriot was patently *not* in violation, one might expect the Kremlin to try to run with this ball if Patriot was close enough to the "strategic" line. This is by no means

conclusive of the fact that Patriot does *not* violate the technical definition of ABM; it is, however, suggestive.

This brings us to those cases where the Soviets are known to have been engaged in, at the least, ABM-like activities. It is widely known that the Soviets for some time have experimented with SAM systems that have some degree of anti-ballistic vehicle capability. The substantial nature of their SAM establishment and their rapid pace of defensive modernization are a matter of record. So have been their preoccupation with both Pershing II and other developments (notably low observables when applied to cruise missiles). Hence, it is not surprising that two recent systems--the SA-10, now deployed in large numbers, and the as-yet developmental SA-12--should seem to have a nominal anti-ballistic missile handling capability. In addition to reaping the fruits of impressive Soviet SAM design progress, these weapons have in common targets that present lower-than-ever radar signatures, may be operating at very low altitude and in a highly uncooperative fashion¹⁷, or may be traveling at high speed. The consequences of such a threat are the same in any case: what designers must minimize is reaction time and "dead zone."¹⁸ To do so requires a very snappy missile and advanced electronics: a "brute force" solution like that seen in the SA-5 is out of the question.¹⁹ But such capabilities not only compensate for reduced reaction time and signature, here is also a potential for a latent ATBM capability, even if ATBM had not been an original design goal.

This speculation, it seems, is verified by certain facts. One can inspect Reagan administration statements, for instance, which, while critical of Soviet SA-12 activities, nonetheless fail to go so far as to

¹⁷One exploiting routing, terrain masking, and DECM.

¹⁸Dead zone refers to the area around the SAM launcher in which the missile is accelerating, orienting itself, etc., and in which it is, therefore, unable to engage the target. Obviously a gun (or laser) would have a null dead zone, an advantage in some cases.

¹⁹Unless, of course, it is possible to attack bombers prior to their descent to low altitude and/or release of missiles, or unless the missile can cruise toward suspected targets (as did the U.S. BOMARC) and "look down" for them.

accuse the Soviets of an outright violation of the unknown criteria of the Agreed Statement. In Congressional testimony, as well as in official DoD publications (such as *Soviet Military Power*), it is noted repeatedly that the SA-12 has been tested against ballistic missiles, that it is a SAM and that it has some ATBM capability (probably against Lance, and possibly against Pershing), and that it may have some limited strategic ABM capability. However, under direct questioning, no official spokesman has yet explicitly confirmed that the SA-12 has been "tested in an ABM mode."²⁰ The only conclusion to draw is that the SA-12 tests observed to that time did not violate the technical parameters (official or "understood") used by the United States to identify Soviet tests of ABM systems limited under Treaty.

We are left to speculate: the most reasonable supposition is that none of the systems seen so far violate any existing criteria for identifying "strategic" capabilities. On the other hand, it is not impossible that both sides have violated the ABM Treaty and decided not to raise the point. The latter seems somewhat dubious, however, given the lack of reluctance seen in challenging other possible violations of Treaty terms seen, and given the highly sensitive nature of strategic defenses.

CLASSES OF CANDIDATE RULES FOR ATBM RESTRICTION

It is probably likely that we will continue to follow the pattern adopted formally in the strategic setting: namely that nuclear dominates conventional where typing rules and protocols are concerned. Once a particular kind of capability has appeared in a particular manifestation, then analogous manifestations are supposed guilty by association. Consider the case in which we know that Soviet conventional TBM are complemented by nuclear TBM in any number. We may nonetheless opt for the terminal defenses mentioned in earlier sections, fully aware that such deployments may not help much if nuclear rounds are launched first; however, if conventional TBM are launched, the system may pay significant military dividends--although at a high financial cost.

²⁰DoD Authorization for Appropriations for FY1986, U.S. Senate, Armed Services Committee, Part 7, p. 3916, is typical.

Given such costs, we must consider, as a nation and as an alliance participant, the many alternatives to active defense for deterrence of nuclear attack. From a military perspective, these are generally indistinct. In fact, if nuclear defense is the aim, then comparatively little follows about possible ATBM restrictions in any immediate sense; except, or so common sense advises, that one would intuitively feel that, the fewer the constraints, the better (since we don't need TBM-like systems to accomplish strategic tasks). From this vantage point the question is rather moot. Other than the basic ABM Treaty and possible refinements, there is relatively little in the existing record of negotiations of very much relevance to ATBM.

There are a few rather indirect connections between the general ATBM problem and negotiating history to date that might be cited, if only for the sake of completeness. Three of the leading ones concern so-called "Confidence Building Measures," MBFR, and the INF Treaty. MBFR has, as one general objective, the reduction of those in-place or rapidly introduceable combat capabilities that influence significantly the Central European balance. This figured, anyway, in the so-called Option III offer, tabled by the West in 1975 and not withdrawn for several years; this would have explicitly traded off a number of Western TNF for a couple of Soviet tank armies. As it was, the TNF disappeared on their own, though the tanks remain. Since such obsolete TBM as then remained in NATO arsenals were scheduled for replacement anyway, and since these were not covered under Option III, however, this is no real guide to a future option. On the other hand, some Confidence Building Measure schemes attempt to remove the most drastic kinds of threats ("destabilizing" ones) from the theaters, and to this category some nuclear TBM certainly belong. Yet CSBM similarly provides no concrete basis for any substantive proposal. INF is the most directly applicable by far to TBM. While the Zero Option and its successors were mainly concerned with the SS-20, they extended constraints over several other systems.

The notion of extending the existing ABM Treaty and rules is a useful basis from which to begin. It is helpful to note, for instance, that the ATBM loophole seems to exist for four reasons. First, there was no sense of overlap, at the time, between TBM and strategic missiles. Second, given the priority of strategic arrangements at the time, it was thought advantageous not to defocus negotiations excessively. Third, what problems were anticipated were viewed as grist for the SCC. Fourth, in general, the ABM Treaty was viewed as the first step toward a larger, accreting arms control structure. At some point, then, ATBM would inevitably be brought under the wing of such expanding negotiations. So the expectation that ABM limitations would grow to incorporate ATBM was there. Yet the ways in which such expansion might occur were not well known; there is no evidence of the existence of any roadmap for grafting ATBM provisions onto the corpus of the ABM treaty and its amendments.

The Treaty accomplishes a number of things: it lays down useful rules on allowable technologies for ABM, location of ABM, testing rules, technology transfer, radar and site parameter, etc. According to many, some of these are inapplicable to the present ATBM situation. But how far down, from definable INF to the SS-21 type threat one can go without overwhelming the definitional possibilities cannot be said. Immediately, i.e., at longer, INF ranges, extension of an ABM Treaty-like protocol would bump against, and ideally resolve, the question of overlapping TBM ("not strategic") and SLBM ("strategic") targets that might nonetheless have similar betas, speed, etc. Second, like it or not, at some point noncircumvention and nontransfer policies have to be faced.

Even so, it may be possible to pursue a parallel approach to ATBM limitation rules that is based directly on the military purposes of either or both sides' ATBM (and TBM). These rules would follow from a variety of more tactically-grounded judgments. This is not as impossible as it may sound at first to some: after all, every other decision--from improving NATO infrastructure to deploying INF--is based on the same such predicates, although our decisions to act in a certain

way rarely are articulated so straightforwardly. There exists, as a bounding case, the situation in which we are confronted with a basic choice about nuclear strategy as it affects not the course of a theater interaction, but rather the proper balancing of the various components of a full deterrence concept. On the other hand, take as a more modest goal the tactical objective of undercutting the TBM's contribution to the net Pact air operation, and not much more besides that.

In the former case, we might otherwise be searching for a nearly ideal defense, literally a theater version of the SDI. Accordingly, the demands on a Treaty designed to substitute for such a capability (if available at any price) would be relatively great. In the latter case, we have as objectives: (1) the terminal defense of a reasonable number of targets against attack packages (consisting of aircraft, various air-launched ordnance, TBM, and, ultimately maybe, cruise missiles) that might allocate "several to many" missiles to each installation--in other words, we are asking for a fairly good defensive capability against a total threat numbering in the hundreds of TBM (i.e., we are asking that our ATBM generate, say, "a couple or a few hundred kills" of Pact TBM); and (2) the denial of Soviet efforts to support indirectly the primary aims of an early-war air operation by, notably, hole-busting in NATO's SAM belts. In this case, we expect much less from our ATBM, and we can afford to be more "casual" in what we demand of arms control.

The point here is not to quantify the degree of difficulty involved or suggest techniques, it is merely to say that, from a military point of view, the importance of arms control depends on how much we are willing to spend on alternative techniques for dealing with the threats before us; and the difficulty of each arms limitation effort is liable also to be directly related to the reliability we expect from our initiative. Above all, it is imperative to recall the reduced importance of symmetry. The ABM Treaty's objective of stability has no immediate parallel with the conventional TBM context. For instance, all of the success in a TBM/ATBM negotiating framework, competitive deployment situation, or for that matter the air war as a whole, will not count for a very great deal if NATO, reluctant to escalate, loses the conventional ground war. It may be lopsided tank, armored vehicle,

artillery, and other ratios which, therefore, will ultimately make or break NATO defense.

So, as crucial a capability as ATBM may be (or as important as we may deem it to put a lid on TBM or ATBM capabilities), we have to admit that, no matter how much we subscribe to any TBM/ATBM coalition policy, we should not divert a given share of our precious funds toward the realization of those aims until we have dealt with some of the other adverse European conventional defense facts of life.

THE SCOPE OF TBM/ATBM LIMITATION

Suppose that a given regime for TBM and/or ATBM talks has been defined. What is the possible scope of a negotiating forum? Many points come to mind, but the most important, is that it is unlikely that a narrow TBM (or ATBM) restraint regime could exist. Constraints could be necessary not just in the immediate area of interest, but in many corollary ones, as well.

To see why, recall that the Soviets invest huge sums in their homeland air defense forces. A not inconsiderable amount of this money goes for traditional SAM defenses (some 10,000-12,000 rails) in spite of the apparent deficiencies of such systems to routing, suppression, orchestrated ECM, saturation by ALCMs, and other tactics and means. Accordingly, we need to ask whether the Soviets would spend untold rubles to shoot down bombers and not worry about powered weapons that those bombers might launch at various times.

Indeed, for a quarter of a century, the threat before the Soviets has potentially included standoff weapons that can fly in a quasi-ballistic mode (as well as the aerodynamic bomber and ALCM threats). Although Skybolt²¹ was not procured, SRAM was. SRAM II is coming along, as is the new French ASMP missile. The Soviets, according to some reports, had such threats in mind when they designed the SA-10 and maybe the SA-12 SAM. In short, one could not restrain ATBM of a certain type via TBM restrictions--it would seem--unless one also contended with the problem of air-launched missiles as well as TBM.

²¹A weapon that *might* have joined the arsenal of not just the United States, but a third power, the United Kingdom.

There are other kinds of spill-over as well. For another example of the necessary expansion of TBM restraints that would have to occur, we would have to restrict not just land-based but probably also various sea-based missiles.²² Much falls under the aegis of maritime Anti-Surface/Anti-Air Warfare, but the current category of greatest interest concerns strikes against the highest value capital formations, especially U.S. carrier battle groups. Over the years, the U.S. Navy has concluded that the best way to assure the survivability of its combat units was to establish an increasingly remote set of defense perimeters. Devoting extraordinary ingenuity and vast resources to the problem, the U.S. Navy has deployed powerful combat systems so as to better sanitize close-in defense rings and move more remote rings further out. In turn, the would-be attacker has resorted to stand-off weapons and launch platforms of ever-increasing range, speed, etc. By saturating and complicating defense, Soviet planners maximize the chances of getting a few weapons through all layers of the defense.

Predictably, the Soviets have contemplated long-range weapons that are in fact true TBM (like the never-deployed SSN-X-13), or that have (from the defender's perspective) lots of TBM-like features, such as cruise missiles that may convert from typical aerodynamic flight into a terminal high-speed dive. Unlike defense on land, there is no point in area defense: why defend empty ocean?²³ Maritime defenders have the advantage of central control, their target acquisition limit is the horizon, many clues can help indicate when OTH threats are evolving, and weight and volume limits for these "mobile" forces aren't onerous.

Unsurprisingly, a full-up system now exists in the field that probably could be shown to be quite capable in handling some current TBM. Unfortunately, no data has been released on the ability of the

²²Maritime operations have figured peripherally in the ATBM debate's history; for instance, a weapon like the SSN-6 has been described more like a TBM than a "strategic" ICBM.

²³Why indeed? Solving this problem with respect to a different kind of threat, the submarine, revealed to the British in World War II that it was better to turn an area-defense problem into a "point-defense" one (i.e., convoy), if possible.

Aegis system, with its array of radars, missiles, data links, ESM, etc., to handle ballistic threats. The nature of the system's role in mind, however, it is unlikely that the U.S. Navy would *not* have built in at least a foundation for ATBM operations into this system.²⁴

In short--and without even raising the verification issue--limitations on TBM are likely to necessarily lead to such broad contexts for considering limitation (regardless of geography, scenario, nation, type of conflict, etc.) that the prospects look unpromising.

PASSIVE CONSTRAINTS AND FEASIBILITY DETERMINANTS OF ATBM

It is useful to hazard some guesses as to whether: (1) factors exist that are pertinent to the long-range importance of an ATBM limitation scheme that will either restrain ATBM on their own (obviating the need for a given expenditure of time, effort, etc. in pursuit of ATBM restrictions in the first place); (2) factors exist that represent such potentially serious impediments to certain ATBM restriction options that our "in principle" limitation concepts have to accept important *a priori* restrictions on what can and can't be explored. From a practical vantage point, however, structural and self-constraints on ATBM could reduce the necessity of some ATBM limitation plans.

It seems reckless at a minimum to overlook the twin questions of just how much ATBM might set us back, and what budget sacrifices might have to be made to move ahead with a given ATBM enterprise of any sort, and to what end, we simply had been handed a check, we might otherwise have put to use such cash. Once these matters have been resolved, we can turn to other points. Two are the necessary corollaries of ATBM (e.g., air defenses) and the costs of "non- ATBM" ways of accomplishing some of the same tasks as active defense.

Discouragingly, to illustrate the sorts of tradeoff at stake, "upgrading Patriot" is sometimes cited as a relatively inexpensive and expedient first-order ATBM option. The sad thing is that Patriot--originally designed for a broad range of applications,

²⁴Currently only the CG-47 class cruiser carries Aegis; but the new Burke destroyers are to receive most of the aerial potential of Aegis, and there has been talk of incorporating Aegis into other platforms.

strategic and tactical alike--is quite expensive. The cost of a Patriot "fire unit" runs to about \$125-150 million for procurement of the tactical hardware alone. (At least one prospective Patriot program participant, Belgium, has found this prohibitive and has been obliged to withdraw from the program.)

The cost-effectiveness issues that would have to be resolved prior to construction of a decision regime on TBM and ATBM policy revolve around admittedly very difficult, interrelated, and uncertain *military and strategic* problems. However, this commentary must not be taken to exclude other factors. For example, I have noted the wisdom of spending more for airbase hardening, extra runways and taxiways, and new dispersal sites for tactical air power (and, going beyond that, perhaps, the acquisition of VSTOL and related exotic and expensive fighter design features). Yet if concrete and labor was free and available in infinite quantities for this purpose, the prospects for expropriating more West German real estate are dim.

The tight resources problem is not a unilateral one. There are overall top-line constraints on Soviet military spending that could be more powerful than ever. Hence, pertinent "cost-exchange" balances become interesting. It has been said, although not demonstrated conclusively, that arms control saves money. An ATBM treaty, for example, might seem additionally attractive if it could be expected to free up funds for use elsewhere.

On the other hand, if the West can compel the Soviets to play at a TBM vs. ATBM contest in which we enjoy certain advantages on account of our technological superiority, and/or the Soviets can be expected to sink resources into ATBM that they might otherwise have devoted to more threatening undertakings, then our thinking about the desirability of ATBM limitations should be adjusted as required. For instance, just as a threat to deploy a certain type of follow-on threat to the B-52 bomber (the B-70) stimulated what is generally seen as a low-payoff, high-cost counter-effort (the MiG-25 and SA-5), so too might we gain some negotiating leverage with the Soviets, drive some of their armored division money into ATBM R&D, etc., by maintaining the right portfolio of TBM and ATBM programs and negotiatory initiatives.²⁵ And the

existence and ranking of alternatives isn't just a Western problem. While NATO must decide that a given air defense extension to incorporate some ATBM capacities is more important than more tactical wings, runways, shelters, tanks, etc., so too must the Pact determine that conventional TBM represent a better means for attacking the West's rear area to a desired degree than the alternatives.

The points here about cost-exchange relationships are pertinent to more than a competition gauged solely by economic criteria. Much discussion about ATBM options--and virtually all commentary on anti-tactical missile limitation one is likely to hear--tends to be all or nothing in nature. There may be far more modest intermediate options that make sense, either as affordable or suitably persuasive TBM/ATBM "future worlds," or as interim goals en route to a future we aren't confident we can describe well now. One that immediately comes to mind is the reconfiguration of the new, high-end NATO SAMs for self- or mutual-defense. Given the nature of the Patriot system and the air environment in the early days of a major Central European conflict, high duty cycles will make Patriot easy to find. And the Patriot is not a very hard target. Perhaps it could prove feasible to undertake a relatively low-cost general upgrade for the Patriot system as a whole to enable it to perform satisfactorily in a close-in self-defense mode. In addition to possibly providing some increased survivability for Patriot or other SAMs at a reasonable price, other very valuable "target islands" within the theater--most importantly, airbases--might also benefit as well.

CONCLUDING REMARKS

ATBM--and TBM--do not exist in a void. Neither should arms control be conducted independent of many other considerations. Consider the net NATO context. There, the quality of our defense capabilities can be directly interpreted in terms of our ability to counter Soviet forces,

²⁵Such deliberate maneuvers by the United States to exploit our advantages and/or exploit systematically Soviet weaknesses in order to divert as much of the Soviet defense effort as possible into nonoffensive channels fall under the rubric of what has come to be known as "competitive strategy."

i.e., those 50,000 tanks, 4,500 aircraft, etc. with which we might have to contend. One way of promoting security is by the acquisition of enough tanks or airplanes (or substitutes, like ATGM or SAMs) to cope with this menace. In this context, then, we need to consider all analysis pertinent to TBM and ATBM--and the question of how far we should be willing to go to effect the limitation of each by negotiated means.

While theater forces planning does not lend itself to simplistic analysis, we need keep in mind two essentially quantitative questions. First, is some aspect of the TBM/ATBM balance either to be prohibited or permitted under a potential treaty program so pivotal in some sense that we cannot do without it--regardless of how the capability in question stacks up in a "cost-effectiveness" ranking or political context? Second, given that it is possible to come up with given future TBM/ATBM regimes, can the investments involved in arriving at alternative futures be better allocated in other ways?

For the time being, the answer to the first question seems to be no. TBM are not a trump card for the Soviets in either their nuclear or conventional manifestations. TBM (excluding strategic-type systems that may resemble TBM) also don't play much of a role at all in current NATO defense plans. The difficulties inherent in extending the concept of "air defense" to a new and larger context are not well known. My opinion is that at the present time ATBM in general is not one of the more burning NATO priorities; and if liquidating the effects of Pact TBM at the present time is a very desirable thing (in a conventional conflict), then there may be less expensive and more robust ways of bringing about the same option than by the design, development, and deployment of ATBM.

Some more "active" defense means against Soviet TBM must be considered as alternatives to ATBM. If the Soviets attempt something ambitious with conventional TBM, for instance, they would probably have to launch several rounds from each launcher. Here they face a tactical trade-off problem. Do they "shoot and scoot"--enhancing the survivability of the launcher group and probably increasing the ultimate number of shots that can be fired over a longer period of time, albeit

thereby possibly diluting the tactical results of, say, an overall air operation? Or do they maximize early shock value at the cost of more effective NATO counter-battery fire?

After the points reviewed above (plus many others) are digested, many residual problems and uncertainties remain. It would perhaps be reckless to attempt to do more than simply outline the kinds of questions that should be subsidiary to the determination of an overall policy on ATBM (one that included arms control) at this time. Now there are some current agenda items that should be considered in an imaginative way, lest things get out of hand later. Some of these include the relationship of ATBM and third-power deterrent forces, the chemical threat posed by TBM, the true nature of TBM in Soviet doctrine, the gray areas between TBM and strategic or INF missiles, and so on. If these can be assessed while avoiding the overbearing influence of such things of SDI, we will have done well.

A Western decision on ATBM, all things considered, should begin with NATO's priorities and goals, for symmetric negotiated results will produce nothing resembling a symmetric policy outcome. Yet, for a change, the West seems to be in a relatively favorable situation. The West does not really seem to want TBM, and until now Soviet TBM have not threatened us too much compared with other things. I have implied that as we make decisions on ATBM policy, they should reflect effectiveness considerations. For NATO, for the time being, ATBM are likely to be self-limiting--not in the sense that both sides will eschew the option, but because any ATBM would probably be sufficiently specialized that a costly, contentious, widespread deployment would be improbable.

The Soviets face a potentially more complex balancing act when it comes to their ATBM policy. On the one hand, the Soviets are known to be interested in any kind of active defense, and they face certain strategic threats that overlap with the conventional TBM one. Moreover, were NATO to actually begin to pursue advanced conventional TBM of its own, the USSR would feel compelled to respond. Balancing what would therefore seem to be certain incentives to go ahead with an ATBM system, the Kremlin has to recognize the consequences it would face if NATO moved in turn to block its already considerable investment in TBM.

Under the circumstances, perhaps the best thing for the West to do now, then, would be to let the Soviets take the first steps in defining ATBM arms control possibilities. To the extent that arms control priorities should be defined, the bug-bear is probably TBM, and not ATBM. A Soviet sense of "pressure"--encouraged by appropriate Western R&D--might use the ATBM/arms control issue rather as a route toward a more important goal, specifically TBM reductions.